

REMARKS

Claims 1-10 and 23-32 are pending in the application. Claims 11-22 have been cancelled without prejudice or disclaimer to the subject matter therein. Claims 1-10 and 23-32 are rejected. Claims 1 and 23 are independent. Claims 2-10 depend from claim 1. Claims 24-32 depend from claim 23.

Rejection Under 35 U.S.C. § 103(a)

Claims 1-6, 8-10, 23-28 and 30-32 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 2,900,182 to Hinks (hereinafter “Hinks”) in view of U.S. Patent No. 3,958,840 to Hickox (hereinafter “Hickox”). Applicant respectfully traverses this rejection for at least the following reasons.

Claim 1 recites, *inter alia*, “An annular shim member having first and second opposing surfaces and a plurality of openings formed therethrough, wherein the member is made from a metallic material and at least partly defines a plurality of radially extending gas flow paths for communicating a radially interior side of the member with a radially exterior side of the member, the annular shim member being substantially planar.”

Claim 23 recites, *inter alia*, “An annular shim member having first and second opposing surfaces and a plurality of openings formed therethrough, wherein the member is made from a metallic material and at least partly defines a plurality of radially extending gas flow paths, the annular shim member being substantially planar.”

Hinks discloses laminated bearings having shear spring properties. The bearings have alternate layers of metal and elastomer bonded to each other (see, claim 1 in Hinks). FIG. 7 in Hinks shows the bearing being provided with a central aperture that is defined by the alternate layers of elastomer and metal (see, col. 9, lines 30-42 in Hinks).

As conceded in the Office Action, Hinks does not disclose the metallic members have a plurality of openings. However, the Office contends that Hickox discloses that it is known in the thrust bearing art to construct metallic members with a wire screen construction to improve production and lower costs, and that it would have been obvious to one of ordinary skill in the art to make the member in Hinks with the wire screen disclosed by Hickox. Applicant respectfully disagrees.

Hickox discloses a flexible bearing (flexible bearing 5 shown in FIGS. 1 and 2 in Hickox) constructed of layers of elastomer and rigid shims (shims 6 shown in FIGS. 1 and 2 in Hickox), alternately stacked and bonded together. At least some of the rigid shims are replaced with flexible reinforcements of refractory cloth or wire screen (wire screen 9 shown in FIG. 3 in Hickox). The reinforcing material minimizes the number of rigid shims required (see, Abstract in Hickox and col. 2, lines 20-37 in Hickox). The wire screen 9 may be welded or soldered at intersections of the strands. The wire screen 9 provides sufficient strength to maintain dimensional stability of the elastomer under heavy loads that may be imposed upon it by propulsive gases in combination with stresses impressed by hydraulic actuators (see, col. 2, lines 29-37 in Hickox).

First of all there is absolutely no suggestion, motivation or any objective reason to combine Hickox and Hinks as suggested by the Office. Clearly, there is no reason for one of ordinary skill in the art to use the wire screen in Hickox in place of the metallic layers in the laminated bearings of Hinks, as metal and elastomer layers in Hinks bonded to each other in order to provide desired loading characteristics that are needed in bearings.

In fact, Hinks states, in col. 2, lines 25-30, that “in order to permit high unit loadings with negligible compression and to prevent extrusion of the rubberous material from between the plates, while allowing satisfactory deflection characteristics, the bearing must be designed to comply with certain dimensional ratios which have been found to be controlling in such design.” (Emphasis added).

Therefore, Hinks teaches against using metallic plates having openings, otherwise the rubber between the metallic plates would extrude through the opening. Hinks teaches that this is undesirable because this would alter the deflection characteristics of the load bearing. Therefore, one ordinary skill in the art would not be motivated to provide wire mesh plate in place of the metallic layer or plates of Hinks, as this would destroy the intended function of the load bearing.

Furthermore, even if, *arguendo*, one were to make the metallic plates in Hinks with the wire screen disclosed by Hickox, which Applicant does not concede, the wire mesh of Hickox being disposed between rubber layers would certainly prevent the formation of a plurality of radially extending gas flow paths for communicating a radially interior side of the member with a radially exterior side of the member. Furthermore, the rubber being in contact with the wire mesh would prevent any radial flow of gas as the wire mesh would not define a plurality of radially extending gas flow paths.

Moreover, as can be seen in FIG. 3 of Hickox, all of the segments of the mesh 9 are welded at intersections 4, and offer no pathways for gas flow above or below the wires of the mesh. Therefore, even if the wire mesh of Hickox were disposed within the alternating rubber layers of Hinks, the structure of the wire mesh in Hickox would further prevent any radially extending gas flow paths for communicating a radially interior side of the member with a radially exterior side of the member. Claim 1 requires that the shim member at least partly defines a plurality of radially extending gas flow paths for communicating a radially interior side of the member with a radially exterior side of the member.

Furthermore, Hickox does not disclose a “substantially planar” wire mesh. Hickox discloses a frusto-conical annular wire screen. Therefore, there is no motivation or reason to replace the flat metallic layers or plates in Hinks with a conical annular wire screen of Hickox.

Consequently, for at least the above reasons, neither Hinks nor Hickox, alone or in combination, disclose, teach or suggest the subject matter recited in claims 1 and 23. Therefore, Applicant respectfully submits that claims 1 and 23 are patentable over the purported combination of Hinks and Hickox.

Claims 2-6 and 8-10 depend from claim 1. Claims 24-28 and 30-32 depend from claim 23. Therefore, claims 2-6 and 8-10 and claims 24-28 and 30-32 are patentable at least by virtue of their dependence upon claim 1 and claim 23, respectively, and for the additional subject matter recited therein.

Thus, it is respectfully requested that the rejection of claims 1-6, 8-10, 23-28 and 30-32 under 35 U.S.C. § 103(a) over the purported combination of Hinks and Hickox be withdrawn.

Claims 4, 5, 7, 26, 27 and 29 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 2,900,182 to Hinks (hereinafter “Hinks”) in view of U.S. Patent No. 3,958,840 to Hickox (hereinafter “Hickox”) and further in view of U.S. Patent No. 4,227,858 to Donguy (hereinafter “Donguy”). Applicant respectfully traverses this rejection for at least the following reasons.

Claims 4, 5, 7, 26, 27 and 29 depend from claim 1 or claim 23. Therefore, claims 4, 5, 7, 26, 27 and 29 are patentable over the purported combination of Hinks and Hickox at least by virtue of their dependence from claim 1 and claim 23 and for the additional subject matter recited therein.

Donguy fails to cure the deficiencies noted above in the purported combination of Hinks and Hickox. Donguy is relied upon as allegedly disclosing metallic layers with thickness of about 0.8 mm. Donguy does not disclose, teach or even suggest the subject matter recited in claims 1 and 23. Consequently, none of Hinks, Hickox or Donguy, alone or in combination, disclose, teach or suggest the subject matter recited in claims 4, 5, 7, 26, 27 and 29.

Therefore, Applicant respectfully submits that claims 4, 5, 7, 26, 27 and 29 are patentable over the purported combination of Hinks, Hickox and Donguy. Thus, it is respectfully requested that the rejection of claims 4, 5, 7, 26, 27 and 29 under 35 U.S.C. § 103(a) over the purported combination of Hinks, Hickox and Donguy be withdrawn.

Claims 1-6, 8-10, 23-28 and 30-32 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 3,958,840 to Hickox (hereinafter “Hickox”) in view of U.S. Patent No. 2,900,182 to Hinks (hereinafter “Hinks”). Applicant respectfully traverses this rejection for at least the following reasons.

The Office contends that Hickox discloses a shim member is a metallic wire screen comprising openings. The Office contends that the wire screen openings correspond to the claimed plurality of radially extending gas flow paths. Applicant respectfully disagrees.

The plurality of wire screen openings do not correspond to the plurality of radially extending gas flow paths. The term “radially” means along or in a direction of a radius. Clearly, the openings within the wire mesh of Hickox are not radially extending flow paths (in a direction of a radius of an annular wire mesh). Indeed, as can be clearly seen in FIG. 3 of Hickox, all of the segments of the mesh 9 are welded at intersections 4, and offer no pathways for gas flow above or below the wires of the wire mesh.

In addition, as described in col. 3, lines 26-40, Hickox teaches that a “valuable and unexpected result” of the method of manufacturing the flexible bearings is that “the layers 7 of elastomer extrude through the openings in the screen or cloth reinforcing layers and weld together.” Thus, there are clearly no gas flow paths in the Hickox bearing, since the adjacent elastomer layers extrude into any openings and weld together, and Hickox therefore further teaches away from the present invention.

Furthermore, as conceded by the Office, Hickox does not disclose a “substantially planar” shim, as presently claimed. Hickox discloses a frusto-conical annular wire screen. The Office, however, contends that Hinks discloses that it is known in the thrust bearing art

to construct a bearing in any desired shape such as conical or planar. The Office contends that it would have been obvious to one of ordinary skill in the art to make the shim member in any bearing shape such as planar. Applicant respectfully disagrees.

There is no suggestion, motivation or reason to provide a wire screen with a planar configuration as Hickox teaches a particular type of bearing, intended for use as a flexible joint between a rocket case and a movable thrust nozzle, and in which the layers conform to surfaces of concentric spheres (see, e.g., col. 1, lines 37-51; col. 2, lines 50-58). Therefore, Hickox actually teaches away from the claimed “substantially planar” annular shim.

In addition, the fact that Hinks teaches various configurations for a bearing does not provide a reason to modify the conical wire mesh of Hickox and provide a wire mesh with a planar configuration.

Furthermore, even if, *arguendo*, one were to modify the conical wire mesh of Hickox and provide a planar wire mesh, which Applicant does not concede, the wire mesh of Hickox being disposed between rubber layers of Hinks would certainly prevent the formation of a plurality of radially extending gas flow paths for communicating a radially interior side of the member with a radially exterior side of the member. Furthermore, the rubber being in contact with the wire mesh would prevent any radial flow of gas as the wire mesh would not define a plurality of radially extending gas flow paths.

Moreover, as can be seen in FIG. 3 of Hickox, all of the segments of the mesh 9 are welded at intersections 4, and offer no pathways for gas flow above or below the wires of the mesh. Therefore, even if the wire mesh of Hickox is disposed within the alternating rubber layers of Hinks, the structure of the wire mesh in Hickox would further prevent any radially extending gas flow paths for communicating a radially interior side of the member with a radially exterior side of the member.

Consequently, for at least the above reasons, neither Hinks nor Hickox, alone or in combination, disclose, teach or suggest the subject matter recited in claims 1 and 23. Therefore, Applicant respectfully submits that claims 1 and 23 are patentable over the purported combination of Hickox and Hinks.

Claims 2-6 and 8-10 depend from claim 1. Claims 24-28 and 30-32 depend from claim 23. Therefore, claims 2-6 and 8-10 and claims 24-28 and 30-32 are patentable at least by virtue of their dependence upon claim 1 and claim 23, respectively, and for the additional subject matter recited therein.

Thus, it is respectfully requested that the rejection of claims 1-6, 8-10, 23-28 and 30-32 under 35 U.S.C. § 103(a) over the purported combination of Hickox and Hinks be withdrawn.

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Donguy fails to cure the deficiencies noted above in the purported combination of Hickox and Hinks. Donguy is relied upon as allegedly disclosing metallic layers with thickness of about 0.8 mm. Donguy does not disclose, teach or even suggest the subject matter recited in claims 1 and 23. Consequently, none of Hickox, Hinks or Donguy, alone or in combination, disclose, teach or suggest the subject matter recited in claims 4, 5, 7, 26, 27 and 29.

Therefore, Applicant respectfully submits that claims 4, 5, 7, 26, 27 and 29 are patentable over the purported combination of Hickox, Hinks and Donguy. Thus, it is respectfully requested that the rejection of claims 4, 5, 7, 26, 27 and 29 under 35 U.S.C. § 103(a) over the purported combination of Hickox, Hinks and Donguy be withdrawn.

CONCLUSION

Having addressed each of the foregoing rejections, it is respectfully submitted that a full and complete response has been made to the outstanding Office Action and, as such, the application is in condition for allowance. Notice to that effect is respectfully requested.

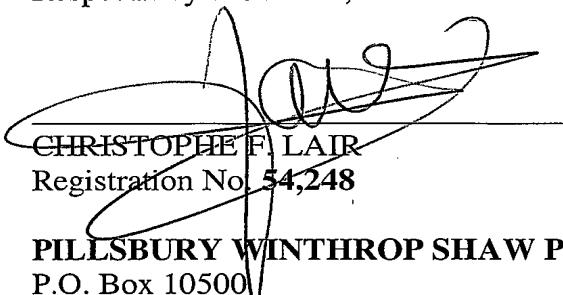
If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Please charge any fees associated with the submission of this paper to Deposit Account Number 033975. The Commissioner for Patents is also authorized to credit any over payments to the above-referenced Deposit Account.

Date: **December 17, 2010**

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